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ductive coal-beds by shafting through the Upper Series, a result which will probably prove of great economical value to the people of this part of the State. A new feature is the publication of popular letters which were originally written for the newspapers by order of the legislature of Iowa while the survey was in progress, a plan which other States might do well to imitate, since it brings directly before the people of each county what the survey is really accomplishing for their benefit. Gypsum was found in such quantities near Fort Dodge that it has been used as a building stone. In Mills county two systems of glacial scratches were found diverging at an angle of thirty-one degrees, and about twenty miles north another system diverging from one of these ninety-three degrees. The first two "approximately coincide with the general courses of the Missouri and Platte Rivers," and the last with "the general direction of the drainage of the western watershed." The "Walled Lakes" of Iowa, a paper also published in the May number of this Magazine, is especially interesting as showing how nature, in some of her processes, may build up a structure so regular that it may be mistaken for an artificial construction. Some space is also given to descriptions of Indian mounds, usually circular in form, but thus far found to be barren of implements or other remains, and occupying the most elevated and picturesque elevations. No conjecture is made in respect to their character or the purposes for which they were intended by their ancient builders.

CALIFORNIA MOSSES.\*—Professor Lesquereux remarks that "The flora of California, in all its departments, is liable to great local varieties, according to the peculiar atmospheric and chemical conditions to which it is subjected. The more the phænogamic flora of that region is studied, the more the number of species is diminished."

THE VARIATION OF ANIMALS AND PLANTS UNDER DOMESTICATION.†—We have but space at present to quote from Dr. Gray's preface to the American Edition regarding this storehouse of facts, with which every naturalist, as well as agriculturist, should be acquainted.

"It is a perfect treasury of facts relative to domesticated animals and some of the more important cultivated plants; of the principles which govern the production, improvement, and preservation of breeds and races; of the laws of inheritance, upon which all organization of improved varieties depends; of the ill effects of breeding in-and-in, necessary though this be to the full development and perpetuation of a choice race or breed; and of the good effects of an occasional cross, by which, rightly managed, a breed may be invigorated or improved. These and various kindred subjects are discussed scientifically with rare ability, acuteness, and impartiality, by one who has devoted most of his life to

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\* The California Academy of Science (formerly California Academy of *Natural Sciences*) has begun to publish quarto Memoirs. Vol. I, Part I, contains a "Catalogue of Pacific Coast Mosses," by Professor Leo Lesquereux. pp. 33.

† The Variation of Animals and Plants under Domestication. By Charles Darwin. Authorized edition, with a Preface by Professor Asa Gray. 2 vols. 12mo, with Illustrations. New York, Orange Judd & Co., 1868. \$6.00.

this class of inquiries, and who discusses them in a way and style equally interesting and instructive to the professional naturalist or physiologist, and to the general reader. To the intelligent agriculturist and breeder, these volumes will be especially valuable, and it is in the interest of such practical men and amateurs that they are here reprinted."

Cosmos. (Weekly) Paris.—This journal, besides giving weekly reports of the proceedings of the French Academy, has a most useful summary of news in all departments of physical and natural science, including rural economy and the application of chemistry to the arts. During the past year it has published, in weekly parts, "The Comparative Geology of Meteorites," by M. Stanislas Meunier, son of M. Victor Meunier, the Editor in chief. The leading article of the present number (dated March 21, 1868) is on the general method of the immediate analysis of meteoric stones, by M. Stanislas Meunier, which is succeeded by an account of M. M. E. Fremy and Terreil's general method of the immediate analysis of vegetable tissues.

M. T. Reiset writes on the ravages of the Cockchafer, or "Hanneton" (*Melolontha vulgaris*), and its larva, the beetle of which in the spring of 1865 defoliated the oaks and other trees, while immense numbers of their larvæ in the succeeding year, 1866, devoured to a fearful extent the roots of garden vegetables, etc., at a loss to the department of the Lower Seine of over five millions of dollars. This insect is three years in arriving at its perfect beetle state. The larvæ hatched from eggs laid by the beetles which appeared in such numbers in 1865, passed a second winter, that of 1867, at a mean depth in the soil of  $\frac{4}{10}$  of a metre, or nearly a foot and a half. The thermometer placed in the ground (which was covered with snow) at this mean depth, never rose to the zero point\* as *minimum*. Thus the larvæ survived, after being perfectly frozen (probably most subterranean larvæ are thus frozen, and thaw out in the spring at the approach of warm weather). In June, 1867, the grubs having become full-fed, made their way upwards to a mean distance of about thirteen inches below the surface, where, in less than two months, they all changed to the pupa state, and in October and November the perfect beetle appeared. The beetles, however, hybernate, remaining below the surface for a period of five or six months, and appearing in April and May. The immature larvæ, warned by the approaching cold, began to migrate deep down in the soil in October, when the temperature of the earth was ten degrees above zero. As soon as the snow melted they gradually rose towards the surface. They began to rise February 23, 1867, when the temperature of the earth had risen a little, being  $+7^{\circ}.1$ , the mean temperature of the soil in January being  $+2^{\circ}.8$ .

QUARTERLY JOURNAL OF SCIENCE. (London.) In the April number Mr. John Mayer writes on the claims of Nitro-glycerine as an industrial agent. It has been used as a blasting material in the operations of mining, quarrying, and railway cutting for about three years. He con-

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\*By the Centigrade thermometer.